



Public Health
Nutrition Program

A photograph of a market stall. In the foreground, a hand holds a green apple. Below it, a large display of red apples is visible. In the background, there are wooden crates and jars of jam.

Food Security and Obesity in San Bernardino County 2017



A background image of an orange tree with green leaves and several ripe orange fruits hanging from the branches. The image is split vertically, with the left half showing a close-up of an orange and the right half showing a more distant view of the tree against a blue sky.

Food Security and Obesity in San Bernardino County 2017

Nutrition Program

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Executive Summary

Food insecurity and obesity have a profound effect on the health and wellness of families within San Bernardino County. Families living with incomes less than 185% of the federal poverty level (FPL) are more likely to be food insecure than families with higher incomes. Obesity is also likely to impact those same families with poor social determinants of health.

Food insecurity affects approximately 93,278 households within San Bernardino County. Many of these families live within food deserts (geographic areas that lack grocery stores within close proximity to where people live) and lack the purchasing power to acquire healthy food.

There is a wide range of obesity rates amongst cities within San Bernardino County, with Loma Linda ranking the lowest (23.7%) and Rialto the highest (36.6%). Taking into account the average income, education, and employment levels of 19 cities for which such data are available, there appears to be a correlation between obesity and social determinants of health such as household size, income, and education.

There are many different food assistance programs throughout San Bernardino County serving youth, adults, and the elderly. These food assistance programs help to alleviate some of the challenges that result from living within food deserts and under the federal poverty level.

The purpose of this report is to:

- Assess the current condition of food security within San Bernardino County.
- Assess obesity rates within San Bernardino County and their relationship to social determinants of health.
- Provide recommendations to address food insecurity and obesity in San Bernardino County.

Introduction

In the United States, obesity is currently the second leading cause of preventable, premature death after smoking. It is classified as both an epidemic and one of our greatest public health concerns affecting more than one-third of the U.S. adult population.¹ In California, 31 percent of the general adult population and 32 percent of the low-income adult population are obese. In San Bernardino County this represents 27 percent and 32 percent respectively.²

As obesity continues to rise, the true health consequences of this epidemic are becoming apparent. Excess body weight translates into earlier mortality and greater morbidity due to relationships impacting the development of a broad spectrum of medical conditions and chronic diseases including type 2 diabetes, hypertension, hyperlipidemia, coronary heart disease, and some cancers.³

Obesity is a complex, multifactorial chronic disease state involving the interplay of behavioral components with genetic, physiological, psychological, metabolic and environmental influences.⁴ The rapid growth of this epidemic implies that there is an interaction of underlying genetic susceptibility with environmental factors that cannot be ignored.⁵

While all segments of the population are affected by obesity, low-resource and food insecure communities are particularly vulnerable. Food insecure neighborhoods are generally seen as food deserts (environments without access to healthy foods) or food swamps (environments that are highly populated with fast food retailers and corner stores). They are usually associated with lower quality diets, higher obesity⁶ and chronic disease rates, and are generally concentrated in low-income and minority communities.⁷ Thus, those with the greatest need for access to healthy foods are without.

Current research has found positive associations with particularly strong and consistent evidence supporting this relationship in food insecure women. The Food Research & Action Center Food Security and Obesity Research Brief (2015) reports the following unique challenges that counter the adoption of healthy behaviors in food insecure communities:

- Limited resources and lack of access to healthy, affordable foods,
- Cycles of food deprivation and overeating,
- High levels of stress, anxiety, and depression,
- Fewer opportunities for physical activity,
- Greater exposure to marketing of obesity-promoting products, and
- Limited access to health care.

To successfully address the challenges that proliferate food insecurity and obesity, public and private partnerships as well as for-profit and non-profit entities must join forces to respond to the problem from multiple sectors. This is not an issue that can be solved by government alone or by any single agency. There is a need for population-level based approaches to address obesity prevention that includes a portfolio of interventions, environmental methodologies and complementary policies to impact the adoption of healthy behaviors, especially in food insecure populations.

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Geography and Demographics

Geographic Area

San Bernardino County is home to 2.08 million residents and is the largest county in the contiguous United States, covering over 20,000 square miles of land. There are 24 cities in the county and multiple unincorporated communities. Eighty-one percent of the land is outside the governing control of the County Board of Supervisors or local jurisdictions; the majority of the non-jurisdictional land is owned and managed by federal agencies.⁸

The county is often divided into four geographical areas, including the Desert Region, the West Valley Region, the East Valley Region, and the Mountain Region.

East/West Valley Regions



Bloomington*
Chino
Chino Hills
Colton
Fontana
Grand Terrace
Highland
Loma Linda
Mentone*
Montclair
Muscoy*
Ontario
Rancho Cucamonga
Redlands
Rialto
San Antonio
Heights*
San Bernardino
Upland
Yucaipa

Mountain Region



Angelus Oaks*
Big Bear City*
Big Bear Lake
Crestline*
Lake Arrowhead*
Lytle Creek*
Oak Glen*
Running Springs*
Wrightwood*

High/Low Desert Regions



Adelanto
Apple Valley
Baker*
Barstow
Big River*
Bluewater*
Fort Irwin*
Hesperia
Homestead Valley*
Joshua Tree*
Lenwood*
Lucerne Valley*
Morongo Valley*
Mountain View
Acres*
Needles
Newberry Springs*
Oak Hills*
Phelan*
Piñon Hills*
Searles Valley*
Silver Lake*
Spring Valley Lake*
Twentynine Palms
Victorville

*Unincorporated Areas

Increase in Population Size

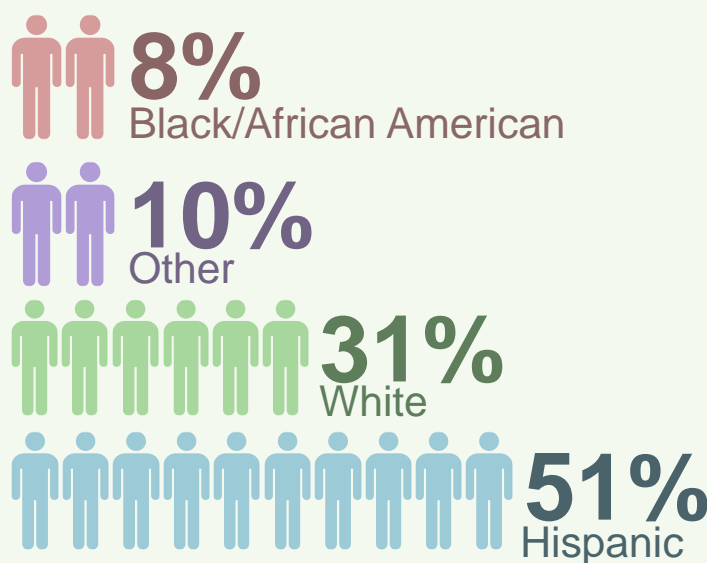
The total population of San Bernardino County has increased by 18.6% between 2000 and 2016. San Bernardino County has the fifth largest population in California which, as of July 1, 2016, is 2,140,096.⁹

The Hispanic population in San Bernardino County has grown by 36.2% since 2000. The White (non-Hispanic) population has decreased over the last 15 years by 12.2%. The Black/African American (non-Hispanic) population has been relatively steady during this time-frame with a decrease in population of less than 1%.



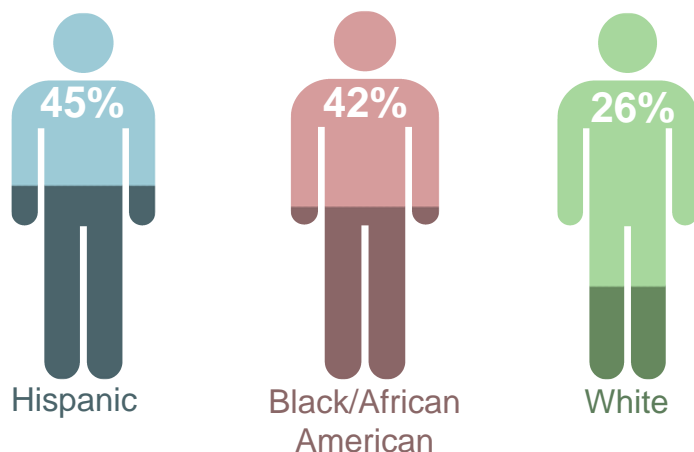
Population of County by Race/Ethnicity

As of 2016, the Hispanic population in San Bernardino County is 1,050,173 (51%), the White (non-Hispanic) population is 660,447 (31%), and the Black/African American (non-Hispanic) population is 170,307 (8%). All other races total 10%.¹⁰



Percent of Population Below the 185% FPL by Race/Ethnicity

The San Bernardino County population living below the 185% FPL is 40.5%.¹¹ Despite comprising only 8% of the total population, the black/African American population has the second highest rate of poverty (42.32%). The Hispanic population has the highest rate of poverty (44.95%). The White population has the lowest rate of poverty (27.46%).



Food Security

Food Security and Nutrition

Food security and nutrition are significantly linked. Access to healthy food at all times mitigates many health risks associated with hunger, inconsistent meal periods, and poor diets. Poor access to food leads to a shift in consumption of calorically dense, non-nutritious foods which may lead to obesity and chronic health conditions for low-income minority communities.

Food Security

According to the United States Department of Agriculture, food security is defined as access by all members at all times to enough food for an active, healthy life.¹² Food security includes at a minimum both the ready availability of nutritionally adequate and safe foods, and assured ability to acquire acceptable foods in socially acceptable ways (without resorting to emergency food supplies, scavenging, stealing or other coping strategies).

In San Bernardino County, 88% of people are food secure.¹³ This equates to an estimated 1.8 million people with access to healthy food at all times.

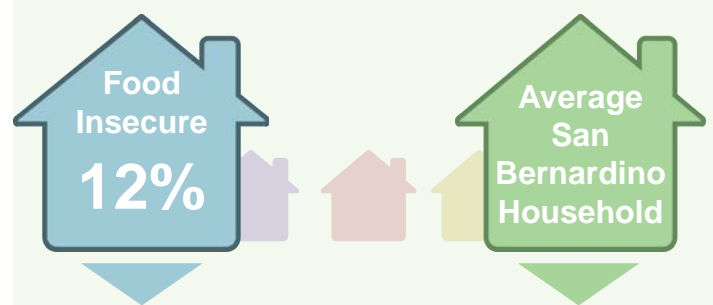
In San Bernardino County, there are approximately 515 grocery stores, 22 farmers markets, and 10 registered fruit/vegetable markets.¹⁴

Food Insecurity

Food insecurity is defined as limited or uncertain availability of nutritionally adequate and safe foods, or the inability to acquire acceptable food in socially acceptable ways.

In San Bernardino County, 12% of people are considered food insecure (253,587 people). These families generally live in areas where there are no grocery stores within walking distance and have little purchasing power to acquire healthy food.

Comparison Between Food Insecure and Average San Bernardino Households



Median Annual Income¹⁵

\$37,392



43%
more
money

\$53,433



Average Weekly Dollar Amount for Groceries¹⁶

\$92



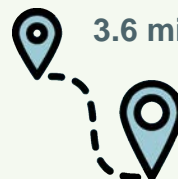
\$39
more
dollars

\$131



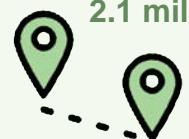
Average Distance to Grocery Store¹⁷

3.6 miles



1.5
more
miles

2.1 miles



Health Consequences of Food Insecurity

Infant and Early Childhood Health

Young children between the ages of two and three are significantly affected by hunger. During this time in a child's development, chronic hunger may lead to the following:¹⁸

- Brain impairment
- Debilitated social and emotional development
- Iron deficiency
- Low activity levels
- Protein-energy malnutrition
- Reduced motor skills

Children's Mental Health

Children who are impacted by chronic hunger are also more likely than food secure children to experience chronic mental health conditions.¹⁹ Children who experience chronic hunger may have the following problems:

- Behavior problems
- Depression
- Psychiatric distress
- Stress

Family Health

Families living under 185% FPL often find themselves with restricted food choices. Healthier foods are thought to be more expensive, causing these families to opt for cheaper, calorie-dense foods. This often results in the following:²⁰

- Heart disease
- Hyperglycemia
- Hypoglycemia
- Obesity
- Type 2 diabetes

Older Adults 60+

Older adults age 60 and older have unique factors which may contribute to food insecurity and hunger. They may lack the transportation and resources to access and prepare food.²¹ Food insecurity and hunger increase the risk of the following health issues among older adults:²²

- Asthma
- Cancer
- Congestive heart failure
- Depression
- Diabetes
- Heart disease
- Stroke

Health Consequences of Food Insecurity, continued

Diabetes in San Bernardino County

Type 2 diabetes most often occurs in overweight adults over 40 years old, and is increasing among youth aged 10 and older. A University of California, Los Angeles (UCLA) survey conducted in 2015 discovered that 10.2% of San Bernardino County residents were diagnosed with diabetes.²³

In a 2016 study published by the California Department of Public Health (CDPH), the average number of deaths due to diabetes in San Bernardino County between 2013 and 2015 was 583 (4.5%).²⁴

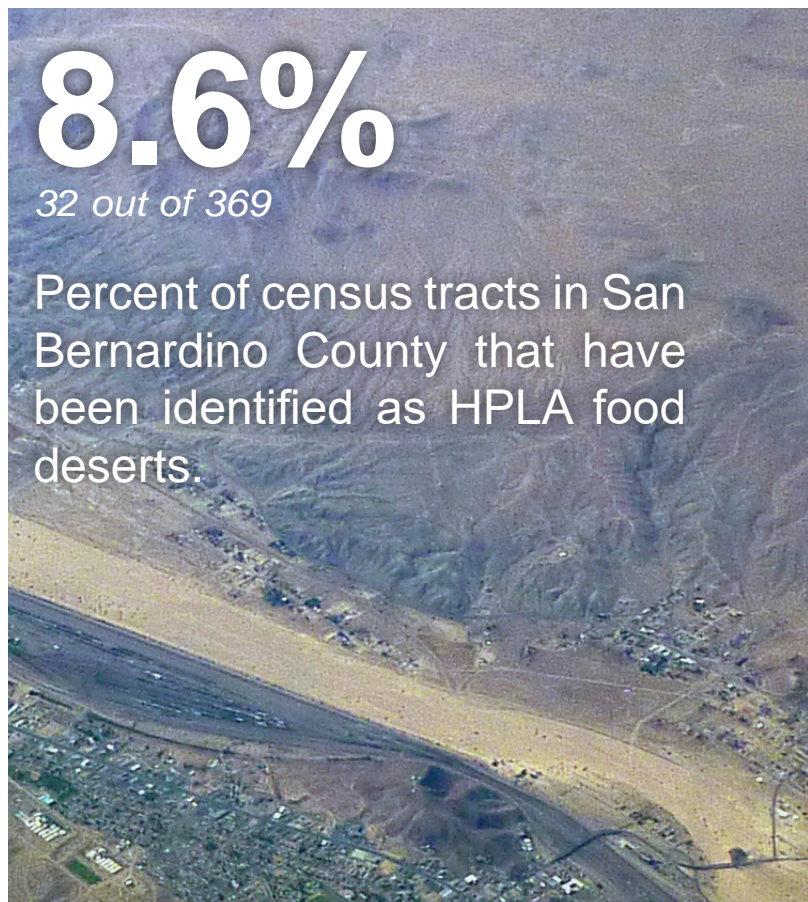
Food Deserts

Food deserts are geographic locations where low-income neighborhoods intersect with low-access census tracts. The United States Department of Agriculture (USDA) defines low-income food deserts as census tracts where the poverty rate is 20% or greater, or a median family's income is less than or equal to 80% of the State-wide median family income. Low-access census tracts are defined as tracts where at least 33% of the population resides more than one mile from a supermarket or grocery store within urban areas, or 10 miles in rural areas.²⁵

High Poverty/Low Access Food Deserts

High Poverty/Low Access (HPLA) food deserts are low-access census tracts where 50% or more of the population earns less than 185% FPL. In San Bernardino County, 8.6% (32 out of 369) census tracts meet the definition of HPLA food deserts.

The largest concentration of HPLA food deserts can be found in the High Desert Region. Nineteen census tracts have been identified as HPLA food deserts in Adelanto, Apple Valley, Barstow, Hesperia, Phelan, and Victorville.



Barstow, California

Food Desert CalFresh Participation Rate

Many eligible families within HPLA food deserts are not participating in the CalFresh food benefit program. The table below looks at the estimated rate of eligible residents not participating in CalFresh within the neediest census tracts. See Appendix A for estimation methodology.

HPLA Race Demographic

Of the 32 HPLA food deserts, 27 have a majority Hispanic population. The five remaining HPLA food deserts have a majority white population. Black/ African Americans are the minority population in 29 of the 32 HPLA food deserts when compared to white and Hispanic populations. The table below further identifies demographics and percentage of population for the associated food deserts.

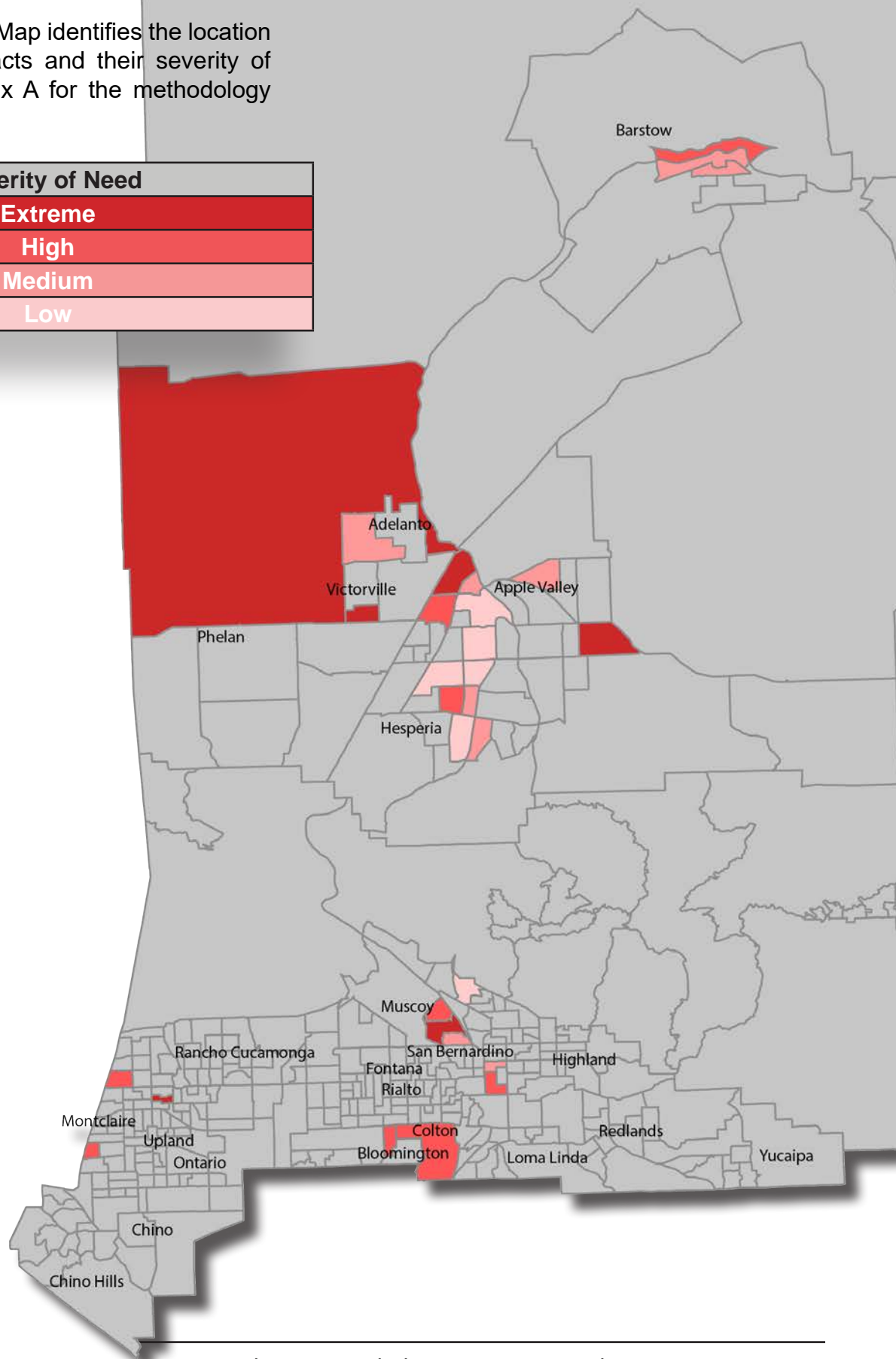
City/Community Food Deserts	Census Tract	Not Participating in CalFresh	Racial Majority	% of Population
Apple Valley	97.12	52.8%	Hispanic	50.5%
Barstow	93	49.6%	White	49.4%
Phelan/Victorville	91.17	44.9%	Hispanic	57.4%
Yucca Valley	104.21	41.8%	White	82.2%
Hesperia	100.15	40.7%	Hispanic	51.3%
Montclair	3.03	40.6%	Hispanic	78.6%
Muscoy	41.01	40.4%	Hispanic	77.6%
San Bernardino	72	31.3%	Hispanic	57.5%
Phelan/Victorville	91.2	30.3%	Hispanic	61%
Bloomington/Colton	40.04	29.4%	Hispanic	82%
Victorville	99.04	27.9%	White	57.4%
Bloomington	40.01	26.8%	Hispanic	76.8%
Twentynine Palms	104.21	23.5%	White	52%
Muscoy	41.04	23.1%	Hispanic	83.2%
Upland	9.03	21.7%	Hispanic	67.1%
Victorville	99.05	21%	Hispanic	57.2%
Hesperia	100.14	19.6%	Hispanic	67.1%
Hesperia	100.10	15.2%	Hispanic	58.9%
San Bernardino	65	14.8%	Hispanic	66.7%
Hesperia	100.19	12%	Hispanic	53.5%
Hesperia	100.11	11.6%	Hispanic	56.6%
Hesperia	100.20	9.2%	White	41.9%
Apple Valley	97.16	4.3%	White	45.2%
Victorville	99.13	1.3%	Hispanic	62.8%
Victorville	98	0.6%	Hispanic	66.1%
San Bernardino	45.10	0.5%	Hispanic	45.1%

Data used from the table in Appendix A.

HPLA Food Deserts

The HPLA Food Desert Map identifies the location of 32 HPLA census tracts and their severity of need. Refer to Appendix A for the methodology and data sources.

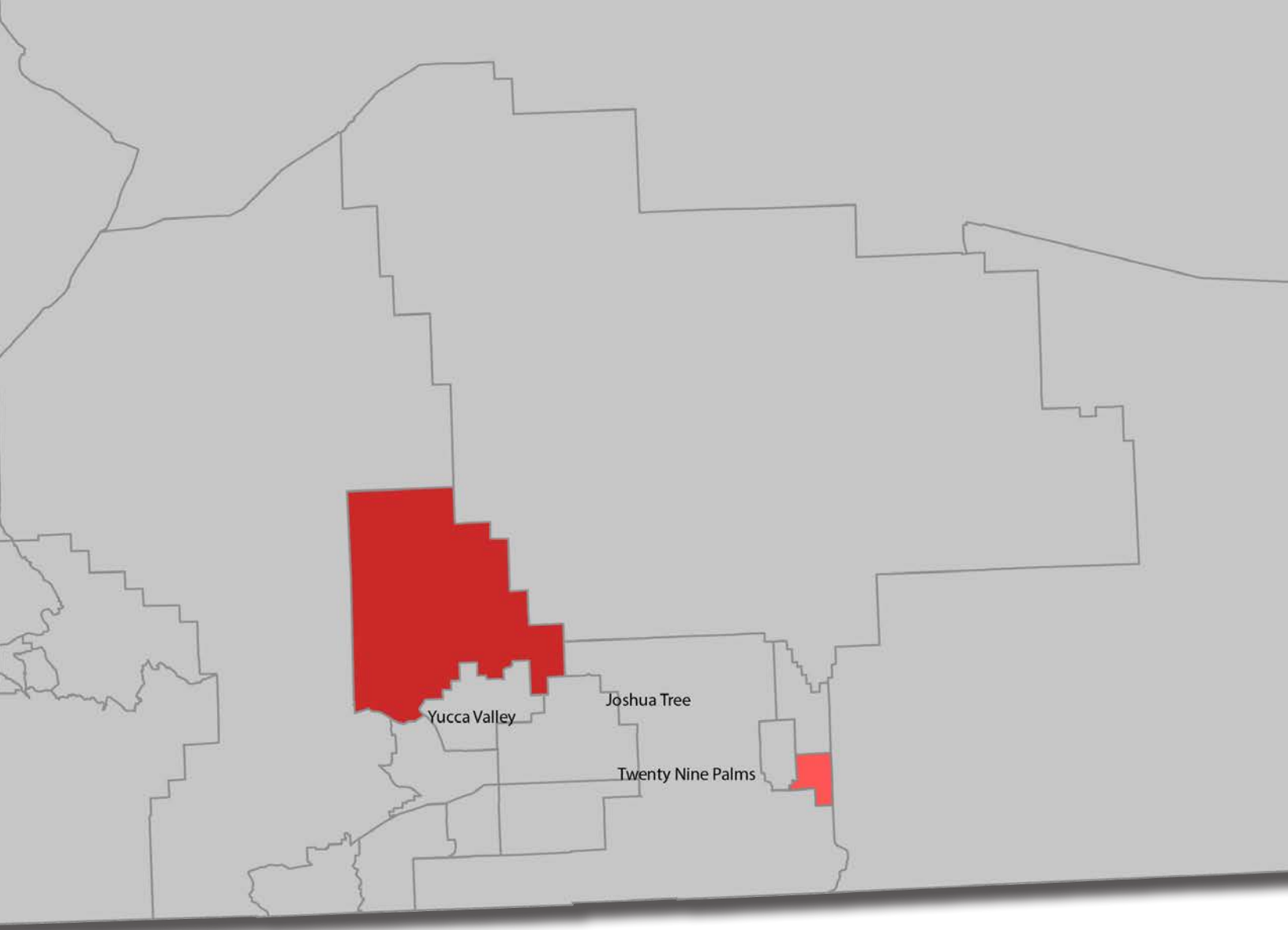
Severity of Need
Extreme
High
Medium
Low



United States Department of Agriculture

Definition of High Poverty Low Access Food Desert:

- Census tracts where at least 33% of the population resides more than one mile from a grocery store, and
- 50% or more of the population earns less than 185% FPL.



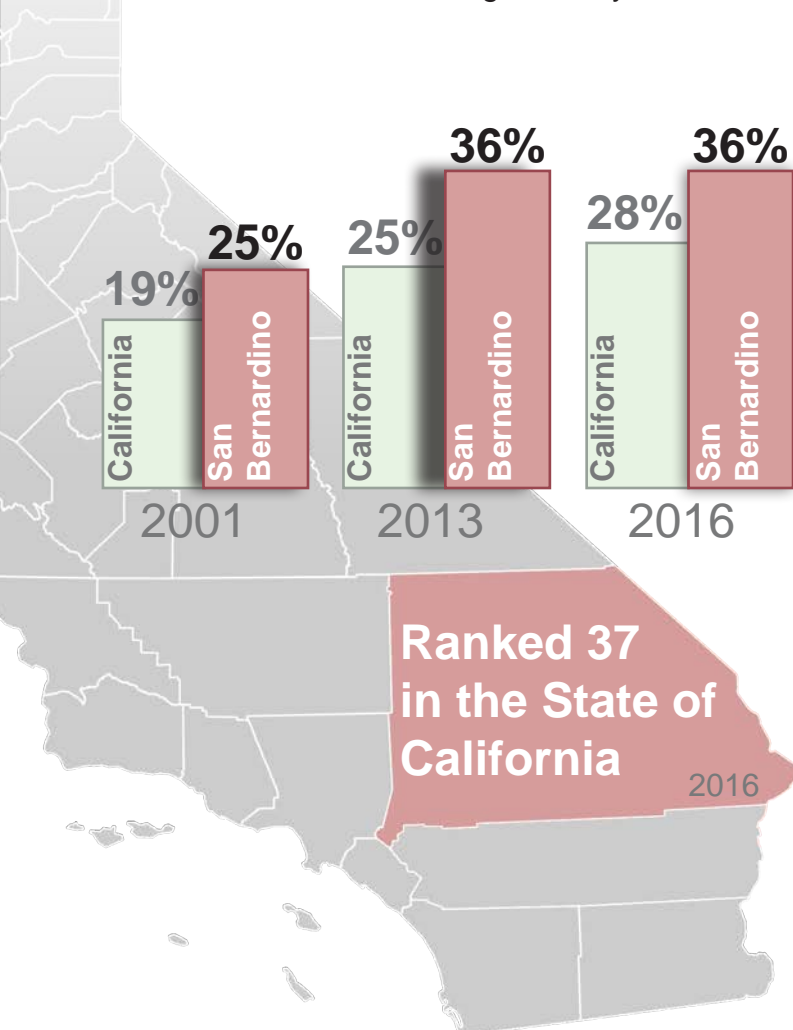
Obesity

Obesity and Nutrition

Obesity is a direct result of an imbalance between declining energy expenditure due to physical inactivity and excessive caloric intake from sugars, starches, and fats. Any excess energy accumulated by excessive caloric intake is stored in the body as fat. Obesity can be prevented or reversed with a combination of proper nutrition and increased physical activity. The following data looks at the current state of obesity within San Bernardino County and its correlation with several social determinants of health.²⁶

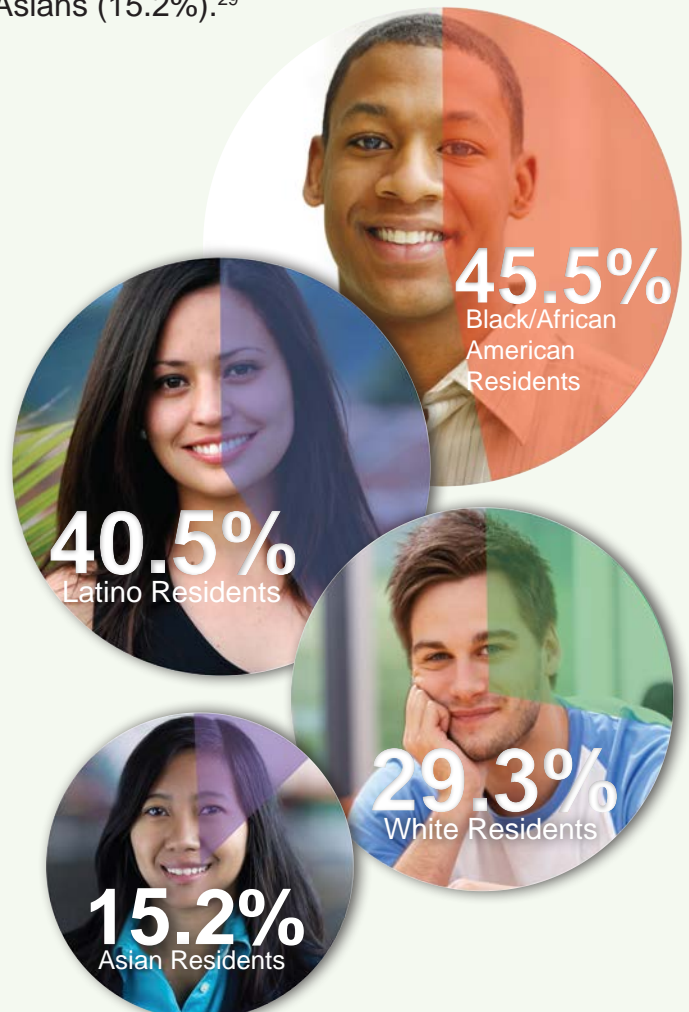
Adult Obesity

San Bernardino County saw a sharp increase in the percentage of adults with obesity from 25% in 2001 to 36% in 2013. As of 2016, the rate of adult obesity in San Bernardino County remained at 36%.²⁷ San Bernardino County ranked 37 of 58 California counties in average obesity rates.²⁸



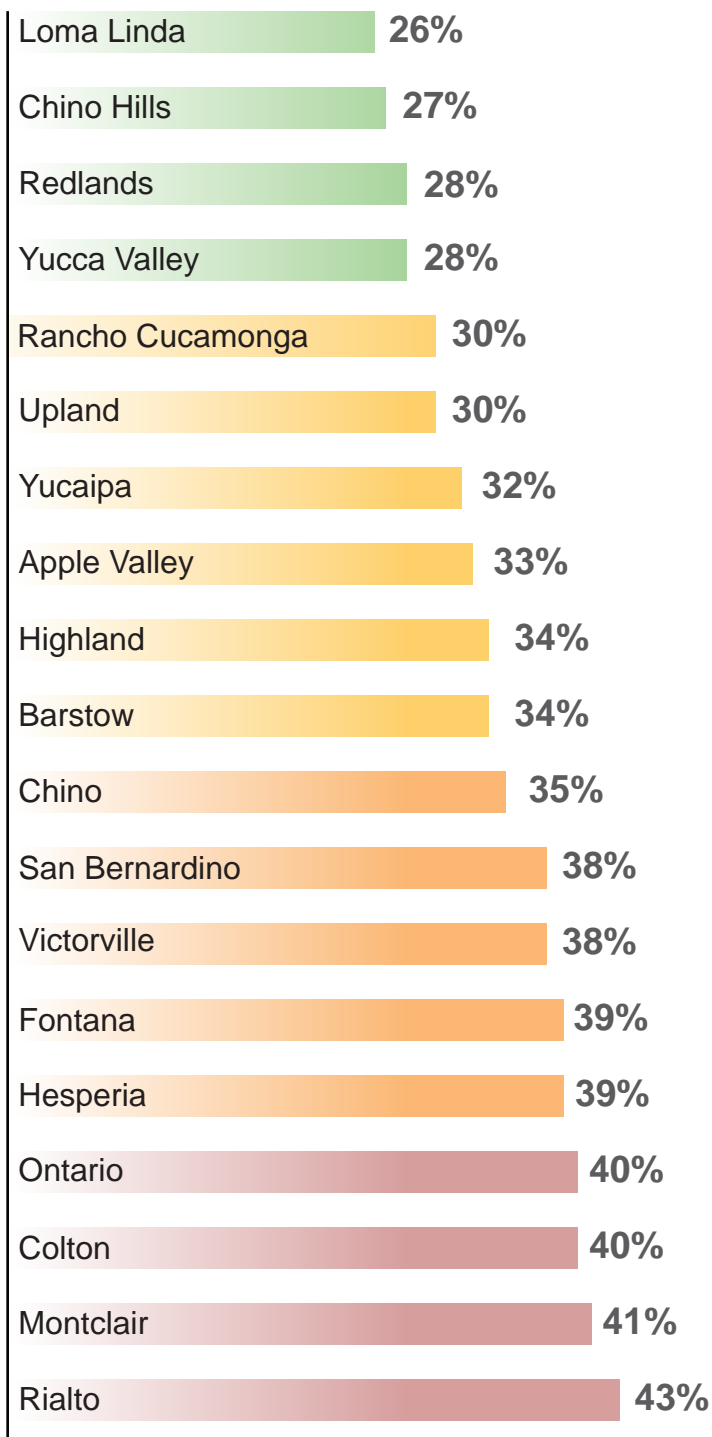
Adult Obesity by Race/Ethnicity

Obesity varies among racial/ethnic groups within San Bernardino County. Of the five most populous racial/ethnic groups in San Bernardino County, Black or African Americans have the highest obesity levels within their population (45.5%), followed by Latinos (40.5%), Whites (29.3%), and Asians (15.2%).²⁹



Adult Obesity by City

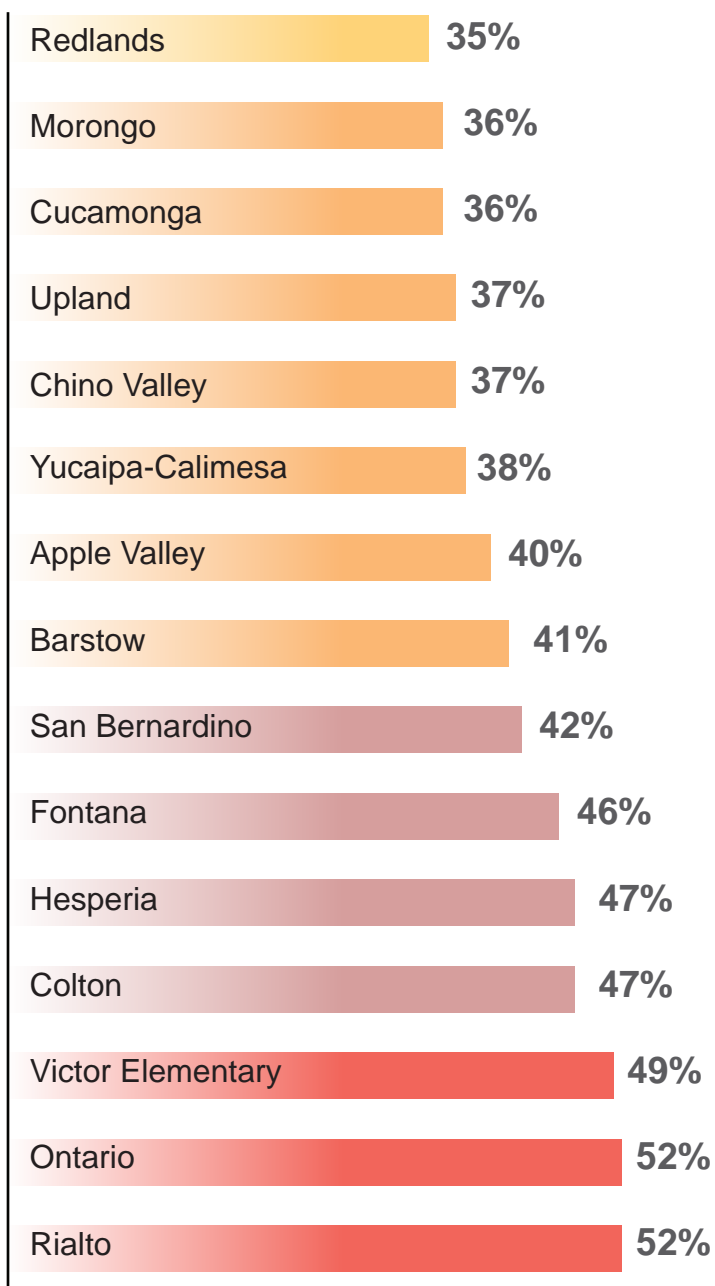
Adult obesity rates throughout San Bernardino County vary between cities. Loma Linda has the lowest obesity rate (26%) while Rialto has the highest (43%).³⁰



Childhood Obesity by School District

A study looking at factors effecting childhood obesity suggests that having obese parents increases a child's risk of being overweight.³¹ This appears to be true in San Bernardino County.

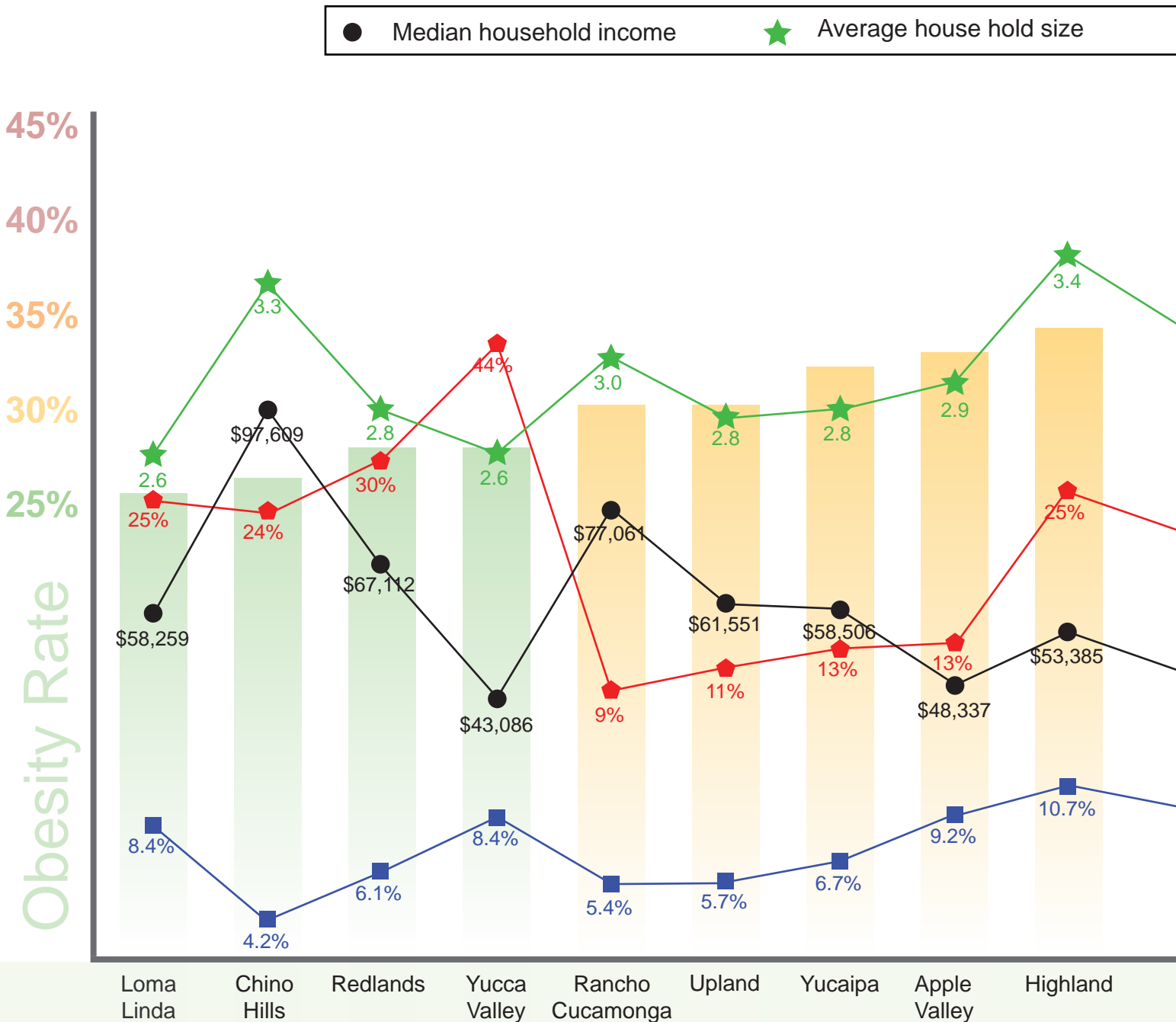
The chart below shows the obesity rate among children at the fifth grade level. When compared to the city most closely served by the school district, the obesity rate amongst children at the fifth grade level are on average 8% higher than adults.³²



Social Determinants of Obesity

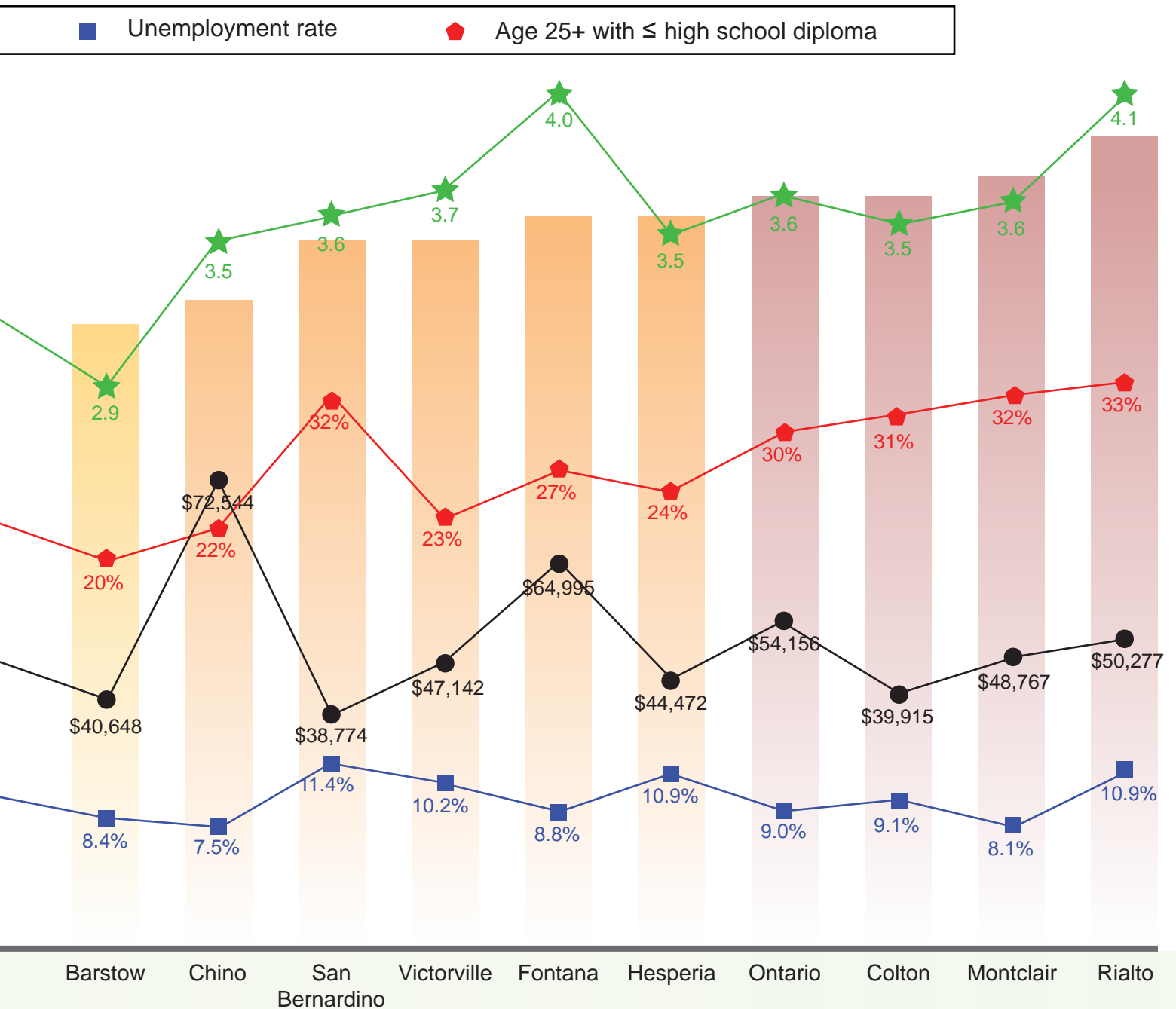
Social determinants of health are various conditions such as household size, income, and education which affect how people live. Research suggests that people who live in poverty-dense communities are the most prone to obesity.³³ In San Bernardino County, 40.5% of the population has an income below 185% of the FPL.³⁴ There are social determinants of health that strongly correlate with the level of obesity within a community, such as median house hold income, education, household size, and unemployment rate.

The following charts compare the obesity rate of San Bernardino County's 19 most populous cities and four social determinants of health.



As the obesity rate increases the following can be observed:

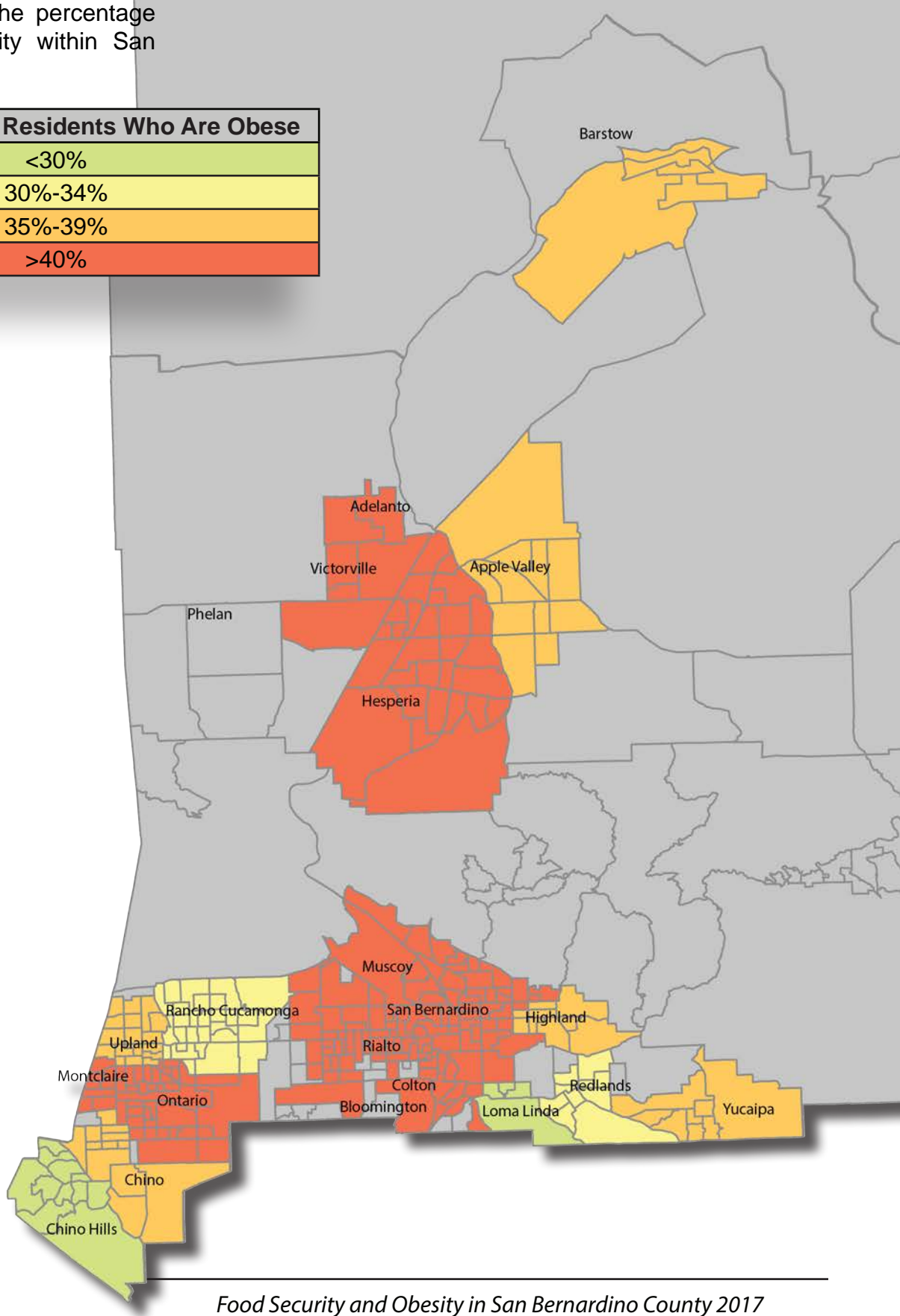
- Median household income trends downward
- ◆ The number of adults with a high school diploma or less trends upwards
- ★ The average household size trends upwards
- The unemployment rate trends upwards



Severity of Obesity within San Bernardino County

This map highlights the percentage of obese adults by city within San Bernardino County.

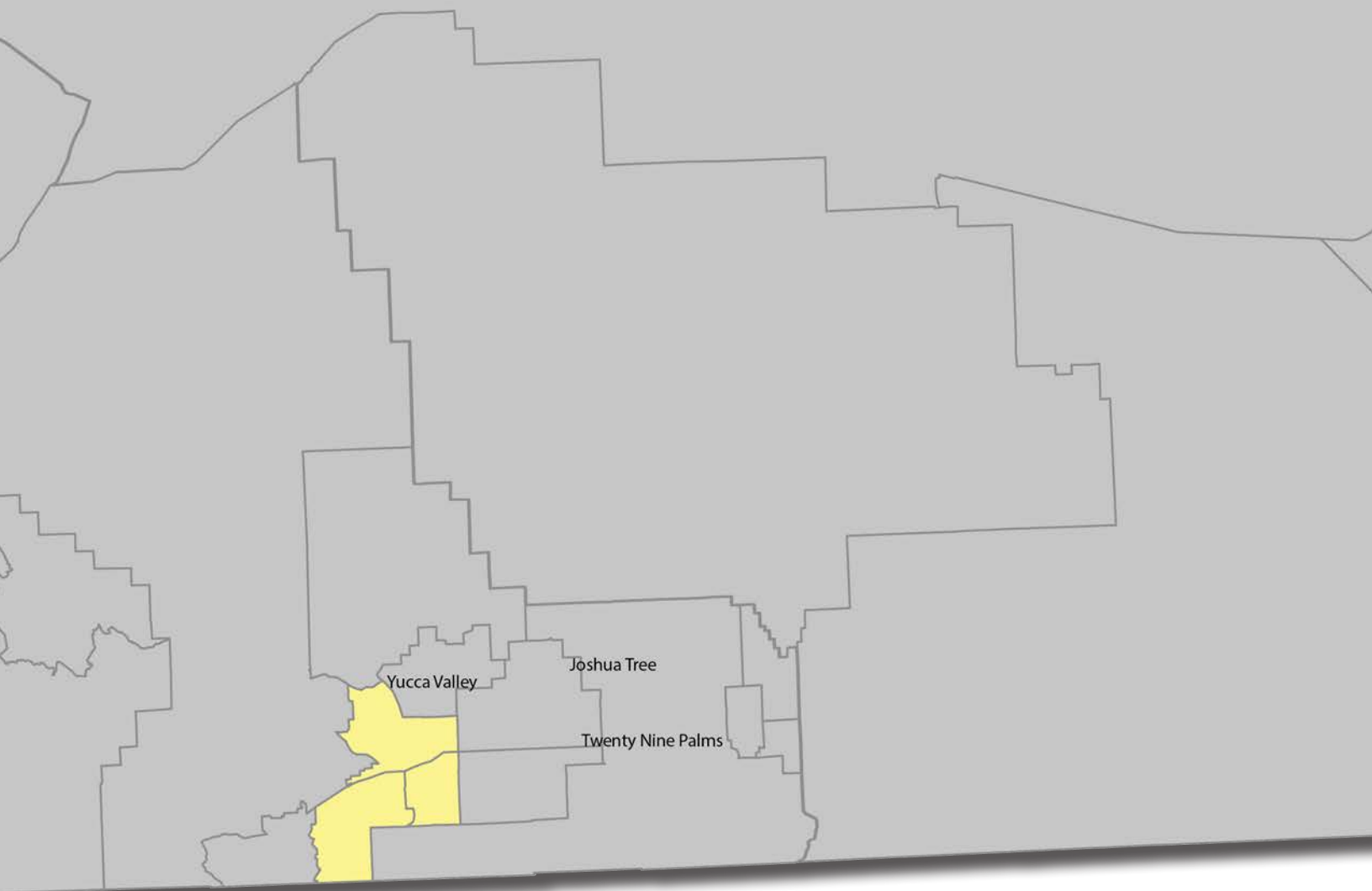
Percent of Adult Residents Who Are Obese	
<30%	
30%-34%	
35%-39%	
>40%	



United States Department of Agriculture

Definition of Obesity:

Having a body mass index* over 30 which results from factors such as genetics, lifestyle, and access to food.



** Body Mass Index - A weight-to-height ratio, calculated by dividing one's weight in kilograms by the square of one's height in meters and used as an indicator of obesity and underweight.*

Food Assistance Resources

Access to Nutrition

San Bernardino County has an abundance of programs and resources free to the public that may help support nutritious diets. These programs and resources may help mitigate the risk of poor nutrition that results from poverty.

CalFresh

The Supplemental Nutritional Assistance Program (SNAP), known as CalFresh in California, provides money to needy families to purchase food in the form of benefits. These benefits may be acquired online, by phone, or by visiting a Transitional Assistance Department (TAD) office. TAD has strategically located its 13 offices to be close to many high need populations.

Nearly 19% of people within San Bernardino County receive CalFresh benefits to supplement their food expenditures.³⁵ Accessing CalFresh benefits greatly enhances the purchasing power of these families toward acquiring more healthy and nutritious food.

www.sbcounty.gov/tad

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

The WIC program supports mothers with children under five and pregnant women living with incomes less than 185% FPL with free groceries. WIC provides families with vouchers to purchase specific nutritious food items such as milk, eggs, cheese, bread, cereal, fruits, and vegetables.

There are an estimated 62,192 participants in the County of San Bernardino WIC program.³⁶ According to a CDPH report released in 2016, the San Bernardino County WIC program served 72% of the eligible population in 2011. WIC has 17 locations throughout San Bernardino County that provide direct services to eligible residents.



62,192

**Participants enrolled in the
San Bernardino County
WIC program.**

WIC also provides additional services in the form of breastfeeding education and nutrition education. These additional services help to empower families in making healthy food choices toward strengthening food security and alleviating hunger.

www.sbcounty.gov/wic/home.aspx

Free and Reduced Lunch Program

The Free and Reduced-Price lunch program serves 296,678 children at schools across San Bernardino County. The program provides both breakfast and lunch five days a week. The percentage of school aged children who qualify for the program has increased from 63.4% in 2010 to 73.5% in 2016.³⁷

www.fns.usda.gov/nslp/national-school-lunch-program-nslp.

Summer Food Service Program

The Summer Food Service Program is a federally funded entitlement program that provides free meals for children and teens 18 years old and under at over 100 locations throughout San Bernardino County. In 2014, 18,634 children participated in the program.³⁸

<https://www.cde.ca.gov/ls/nu/sf/sfspinfo.asp>

Community Action Partnership (CAP)

In 2016, the Community Action Partnership partnered with over 200 charitable and non-profit agencies in San Bernardino County to distribute food to families in the form of meals and groceries. Through these partnerships, 749,203 meals were distributed in 31 soup kitchens. In that same year, the United States Department of Agriculture (USDA) and Salvage Food vendors assisted 379,663 households with groceries. CAP distributed 95,392 pounds of food for the Holiday Food Basket Program in 2016.³⁹

www.capsbc.org



296,678

**Children participating in
the Free and Reduced-Price
Lunch program in San
Bernardino County**

Elderly Nutrition Program

The Elderly Nutrition Program is a San Bernardino County program that provides free meals to older adults as well as anyone with a disability. The program has two components: centralized sites where meals are distributed to residents, and meals delivered to a resident's home. There are currently 37 centralized sites which are facilitated by eight provider organizations throughout the county. An estimated 12,300 individuals were reached in 2016,⁴⁰ compared to 11,213 individuals in 2013.⁴¹

www.sbcounty.gov/daas/resources/nutrition.aspx

Mobile Fresh Bus

The Mobile Fresh bus is a grocery store on wheels which provides healthy food to residents living in food deserts. The Mobile Fresh bus makes 68 stops every month between the Counties of San Bernardino and Riverside and serves on average 800 people. The Mobile Fresh bus accepts CalFresh Electronic Benefit Transfer (EBT) card.

www.fsaca.org/what/mobile-fresh

Food Recovery and Pantries

There are many food pantries throughout San Bernardino County that are involved in recovering and distributing food. These food pantries operate independently out of neighborhood food banks, churches, and community centers. A complete list of food pantries can be found on the United Way San Bernardino 211 website.

www.211sb.org/food

12,300

Individuals receive free meals through the Elderly Nutrition Program.



Conclusion

Food deserts in conjunction with poor socio-economic conditions have a very negative effect on the health of San Bernardino County residents. At the moment, 12% of County residents are living in food insecure households with inadequate access and limited resources to purchase nutritious food. Poor nutrition paired with low physical activity may lead to obesity. Currently, 28% of adults in San Bernardino County are obese. The numbers are even worse for San Bernardino County children whose median rate of obesity for School Districts within this County is 41%.

Recommendations

In order to decrease food insecurity and obesity rates in San Bernardino County, the Department of Public Health, with assistance from other San Bernardino County Departments, should continue efforts to work with cities, schools, and non-government agencies in order to administer a mixture of nutrition and physical activity education, raise awareness of local resources, and conduct research about the relationship between obesity and social determinants of health. The following actions are recommended:

- Improve access to nutritious food in low-income neighborhoods. Partner across public and private sectors to develop innovative solutions that increase the availability of quality, competitively priced nutritious foods, particularly in communities identified as food deserts or food swamps.
- Educate the community about hunger and food insecurity. Educational programs and campaigns offered through the media and schools could be sponsored both publicly and privately to increase awareness and educate the public and policy makers about hunger and food insecurity.
- Expand and mobilize food recovery/waste reduction efforts to supplement emergency food providers and federal food assistance programs by making better use of existing food sources.
- Encourage physicians to screen for food insecurity and intervene appropriately in clinic settings. The American Academy of Pediatrics policy Promoting Food Security for All Children recommends that pediatricians use the Hunger Vital Sign 2-item screening tool to identify food insecurity in families at scheduled visits and include it in the medical record.
- Increase referrals to healthy food assistance programs and resources available in San Bernardino County through the development and distribution of a Healthy Food Resource Guide to assist in the referral process. Increased promotion of services and resources across local, federally funded food assistance programs will help ensure that eligible residents are aware of all of the resources available to them.
- Reconvene the Food Policy Council to raise awareness and address food security through a food systems approach that includes building capacity to identify and address food and agriculture related policy issues and opportunities across the county.

End Notes

1. Tessier & Eagon, 2008; Ogden, Carroll, Kit, & Fegal, 2014
2. SNAP-Ed County Profiles, 2017
3. Centers for Disease Control and Prevention, 2015; Cummins, Flint & Matthews, 2014
4. Tessier & Eagon, 2008; Paddon-Jones, Westman, Mattes, Wolfe, Astrup & Westerterp-Plantenga, 2008; Roux, Donaldson & Goldie, 2006, Cummins, Flint & Matthews, 2014)
5. Albuquerque, Stice, Rodriguez-Lopez, Manco & Nobrega, 2015
6. Weatherspoon, Oehmke, Dembele & Weatherspoon, 2015
7. Dannefer, Williams, Baronberg & Silver, 2012
8. 2015 San Bernardino County Community Indicators Report
9. U.S. Census Bureau Quickfacts San Bernardino County, California
10. <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?> (8/28/2017)
11. <https://www.cdph.ca.gov/programs/NEOPB/Documents/2017Bernardino.pdf>. (4/1/2017)
12. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/> (8/28/2017)
13. http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2014/CA_AllCounties_CDs_MMG_2014.pdf (8/30/2017)
14. GIS data taken from <http://gis.cdph.ca.gov/NEOPBGIS/> (7/24/2017)
15. San Bernardino County Median HH income: <https://www.census.gov/quickfacts/fact/table/sanbernardinocountycalifornia/PST045216>. 32 HPLA census tract Median HH income. Data found at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_B19013&prodType=table. The median was identified by using the median HH income of the 32 HPLA census tracts found in appendix A. (9/11/2017)
16. US family will spend an average of 12.79% of expenditures on food. <https://www.bls.gov/news.release/pdf/cesmy.pdf>. (7/24/2017)
17. <http://www.ers.usda.gov/media/1807325/eib138.pdf> page 6 (link removed from USDA webpage)
18. <http://www.apa.org/pi/families/poverty.aspx> (8/1/2017)
19. Ibid.
20. <http://servingfoodsolutions.com/the-consequences/basic-nutrition/how-food-insecurity-effects-health/>. (7/24/2017)
21. <http://www.feedingamerica.org/hunger-in-america/impact-of-hunger/senior-hunger>. (7/24/2017)
22. http://www.aarp.org/content/dam/aarp/aarp_foundation/2015-PDFs/AF-Food-Insecurity-2015. (7/24/2017)
23. http://ask.chis.ucla.edu/AskCHIS/tools/_layouts/AskChisTool/home.aspx#/geography. (7/24/2017)
24. <https://archive.cdph.ca.gov/programs/ohir/Pages/CHSPCountySheets.aspx>
25. <https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/>. (7/24/2017)
26. <http://www.who.int/dietphysicalactivity/publications/trs916/summary/en/> (7/21/2017)
27. AskCHIS, http://ask.chis.ucla.edu/AskCHIS/tools/_layouts/AskChisTool/home.aspx#/results. (1/11/2018)
28. https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/NEOPB/CDPH%20Document%20Library/RES_2017CountyProfiles.pdf (01/03/2018)
29. http://askchisne.ucla.edu/ask/_layouts/ne/dashboard.aspx#/ 8.21.2017
30. Ibid.
31. <http://news.stanford.edu/news/2004/july21/med-obesity-721.html>. (7/24/2017)
32. <http://www.kidsdata.org/topic/725/student-weight-current/Bar#fmt=1026&loc=366,2&tf=84&pdist=33&ch=623,624,625&sort=loc>.
33. <http://diabetes.diabetesjournals.org/content/60/11/2667>. (7/24/2017)

34. <https://www.cdph.ca.gov/programs/NEOPB/Documents/2017Bernardino.pdf>. (4/1/2017)
35. Human Services 2015 Report, County Residents Receiving Aid & Distribution by Cities.
36. <https://wix.ca.gov/WIX/Login.aspx?ReturnUrl=%2fWIX%2fHome.aspx>.
37. Average from total eligible FRPM students K-12 in 569 schools in the County. Excel file may be found at <http://www.cde.ca.gov/ds/sd/sd/files/sp.asp>. (7/24/2017)
38. <http://www.cde.ca.gov/ds/>
39. <https://www.capsbc.org/2016-accomplishments> (7.18.2017)
40. DAAS ENP Summary 4.17.2017
41. DAAS ENP Summary 7.8.2016

High Poverty Low Access Census Tract (CT) Data Table Methodology

The United States Department of Agriculture (USDA) Economic Research Service (ERS) Food Access Research Atlas was used to identify 64 census tracts (CTs) in San Bernardino County meeting the following criteria for designation as “food deserts”:

- Low income (poverty rate is 20% or greater, median family income is less than or equal to 80% of the state-wide median family income, or median family income is less than or equal to 80% of the metropolitan area's median family income)
- Low access to healthy food (a significant share of individuals living more than one mile [urban] or ten miles [rural] away from the nearest supermarket).

Using data from the U.S. Census Bureau, CTs identified as food deserts were winnowed to include those with high proportions of Black, Hispanic, and/or White residents, with county-wide percentages serving as benchmarks (8.2%, 50.5%, and 31.8%, respectively); this resulted in a list of 32 CTs. Three additional Census variables were added to assist with ranking these 32 CTs by level of need: the proportion of the population with income less than 185% poverty level (a SNAP program criterion), the proportion of families receiving food stamps/SNAP, and the proportion of families with income less than 125% poverty level. The proportion of eligible families not receiving food stamps/SNAP was then estimated for each CT, by calculating the gap between families receiving food stamps/SNAP and families with income less than 125% poverty level, with the latter serving as a proxy for SNAP criteria implemented in October 2015 (income less than 130% poverty level).

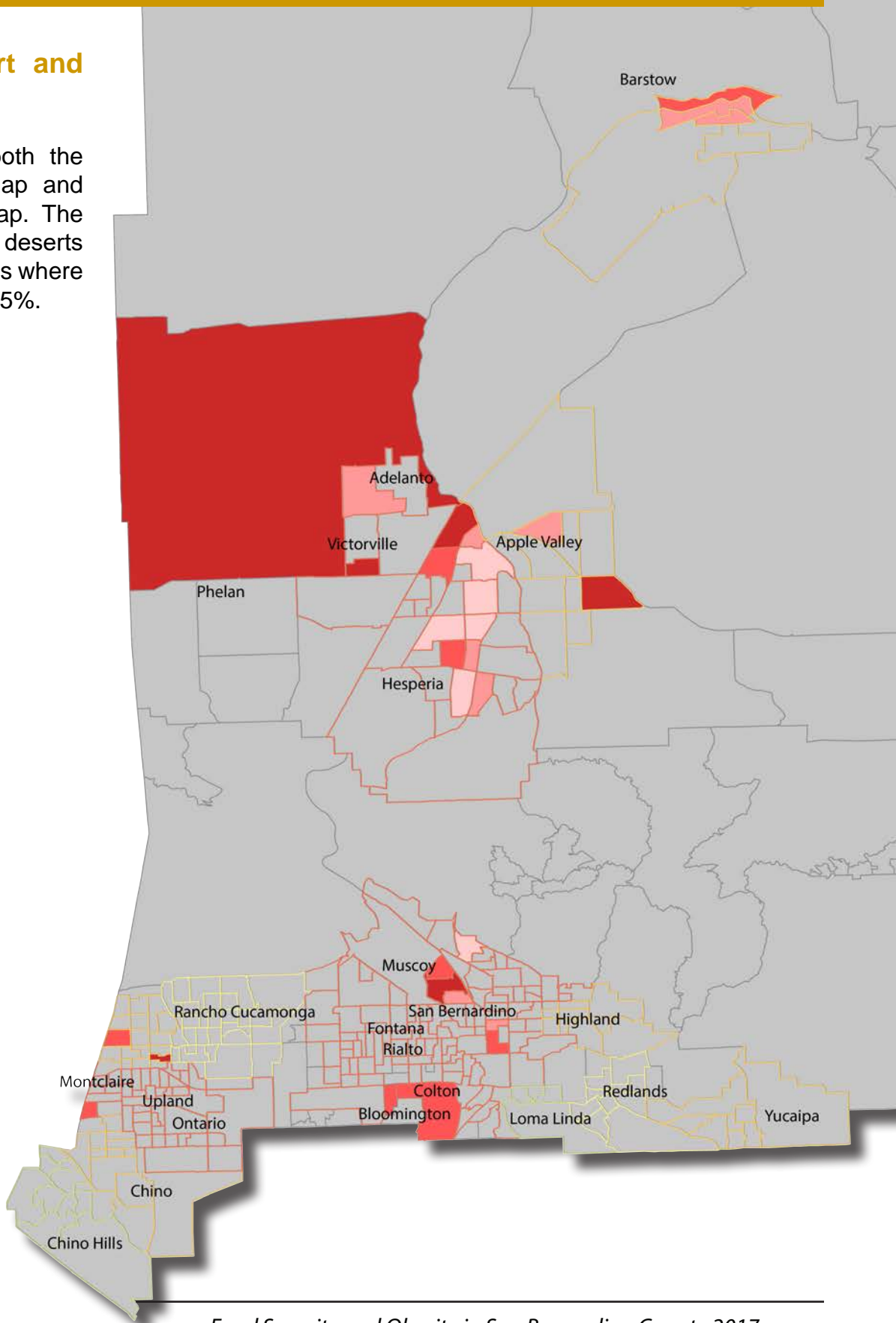
CTs were then ranked in order of highest need (rank 1) to lowest need (rank 32) for intervention from the SBC DPH Nutrition Program. Seven CTs with values above the median (among all 32 CTs) for both proportion of the population with income less than 185% poverty level and estimated proportion of eligible families not receiving food stamps/SNAP were deemed of highest need (ranks 1-7), then ranked among themselves by order of highest to lowest estimated proportion of eligible families not receiving food stamps/SNAP. For example, CT 97.12 ranked first of all 32 CTs, as its proportion of the population with income less than 185% poverty level (63.6%) was higher than the median (59.9%), and its estimated proportion of eligible families not receiving food stamps/SNAP (52.8%) was the highest. The remaining nine CTs with estimated proportion of eligible families not receiving food stamps/SNAP above the median were deemed of next highest need (ranks 8-16), then ranked among themselves by order of highest to lowest estimated proportion of eligible families not receiving food stamps/SNAP. Of 16 remaining CTs, the nine with values for proportion of the population with income less than 185% poverty level above the median were deemed of next highest need (ranks 17-25), and ranked among themselves by order of highest to lowest proportion of the population with income less than 185% poverty level. The remaining seven CTs were deemed of lowest need (ranks 26-32), and ranked among themselves by their proportion of the population with income less than 185% poverty level.

Census Tract	Place Name	Total Population	Hispanic%	White%	Black%	Population < 185% FPL%	Families in Households Receiving Food Stamps/SNAP%	Families Eligible for Food Stamps/SNAP%	Eligible Families NOT Receiving Food Stamps/SNAP%	% Non-Citizens	Rank of Need
Census Tract 97.12	Apple Valley	6,112	46.5	42.4	8.0	63.6	16.1	34.1	52.8	7.9	1
Census Tract 91.17	Phelan/Victorville	7,091	57.4	25.4	13.7	66.8	29.2	53.0	44.9	20.2	2
Census Tract 104.23	Joshua Tree/Yucca Valley	3,614	12.8	82.2	0.0	61.1	17.0	29.1	41.8	6.1	3
Census Tract 91.12	Phelan/Victorville	8,474	61.0	14.0	15.8	61.2	27.3	39.1	30.3	14.9	4
Census Tract 41.04	Muscoy	5,838	83.2	8.8	5.1	67.1	32.3	42.0	23.1	22.7	5
Census Tract 9.03	Upland	4,261	67.1	18.1	6.2	60.2	20.4	26.1	21.7	12.3	6
Census Tract 99.05	Victorville	7,728	57.2	19.8	19.5	63.9	34.1	43.1	21.0	7.6	7
Census Tract 93	Barstow	1,263	42.8	49.4	7.8	58.0	23.0	45.7	49.6	7.0	8
Census Tract 100.15	Hesperia	5,448	51.3	40.8	6.0	50.3	16.2	27.2	40.7	9.6	9
Census Tract 3.03	Montclair	7,364	78.6	12.7	2.7	58.5	17.9	30.1	40.6	23.2	10
Census Tract 41.01	Muscoy	5,602	77.6	15.1	4.0	56.1	23.0	38.6	40.4	18.6	11
Census Tract 72	San Bernardino	7,196	57.5	16.0	2.6	59.6	26.6	38.8	31.3	21.0	12
Census Tract 40.04	Bloomington/Colton	5,753	82.0	12.2	2.8	52.8	18.3	25.9	29.4	21.0	13
Census Tract 99.04	Victorville	11,347	57.4	21.1	16.1	58.5	28.1	39.0	27.9	18.8	14
Census Tract 40.01	Bloomington	4,409	76.8	14.5	4.7	51.7	16.9	23.1	26.8	15.2	15
Census Tract 104.21	Twentynine Palms	6,246	26.7	52.0	13.2	56.1	25.4	33.2	23.5	2.8	16
Census Tract 91.16	Phelan/Victorville	7,163	48.0	19.3	23.7	82.9	64.5	57.7	-11.8	9.2	17
Census Tract 65	San Bernardino	6,905	66.7	10.8	13.9	78.3	45.5	53.4	14.8	18.3	18
Census Tract 100.14	Hesperia	5,317	67.1	25.0	4.7	75.2	39.1	48.7	19.6	12.9	19
Census Tract 94	Barstow	3,622	44.4	21.3	23.9	74.4	55.2	52.9	-4.3	9.0	20
Census Tract 41.03	Muscoy	5,703	87.5	4.1	4.9	69.2	43.4	41.7	-4.1	28.9	21
Census Tract 100.20	Hesperia	7,453	41.2	41.9	12.5	65.8	31.6	34.8	9.2	5.6	22
Census Tract 97.16	Apple Valley	6,801	34.8	45.2	17.7	64.2	41.8	43.7	4.3	5.0	23
Census Tract 98	Victorville	4,788	66.1	21.4	8.6	63.4	43.3	43.6	0.6	17.5	24
Census Tract 95	Barstow	6,965	43.7	33.4	16.9	62.6	41.0	38.5	-6.4	6.8	25
Census Tract 99.13	Victorville	5,556	62.8	28.9	6.6	59.2	35.5	36.0	1.3	17.7	26
Census Tract 100.11	Hesperia	4,821	56.6	23.8	9.8	57.3	32.5	36.7	11.6	9.6	27
Census Tract 100.10	Hesperia	6,573	58.9	31.2	6.7	56.0	25.7	30.3	15.2	10.8	28
Census Tract 45.10	San Bernardino	5,208	45.1	18.3	16.8	54.4	29.9	30.0	0.5	10.4	29
Census Tract 100.26	Victorville	11,817	40.3	28.6	12.9	54.2	31.4	30.0	-4.4	8.7	30
Census Tract 100.19	Hesperia	5,640	53.5	38.3	6.6	54.0	25.3	28.7	12.0	8.8	31
Census Tract 21.01	Rancho Cucamonga	4,560	66.9	15.5	11.5	50.6	21.7	10.4	-108.8	15.1	32

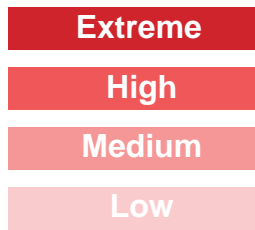
Appendix B

HPLA Food Desert and Obesity Map

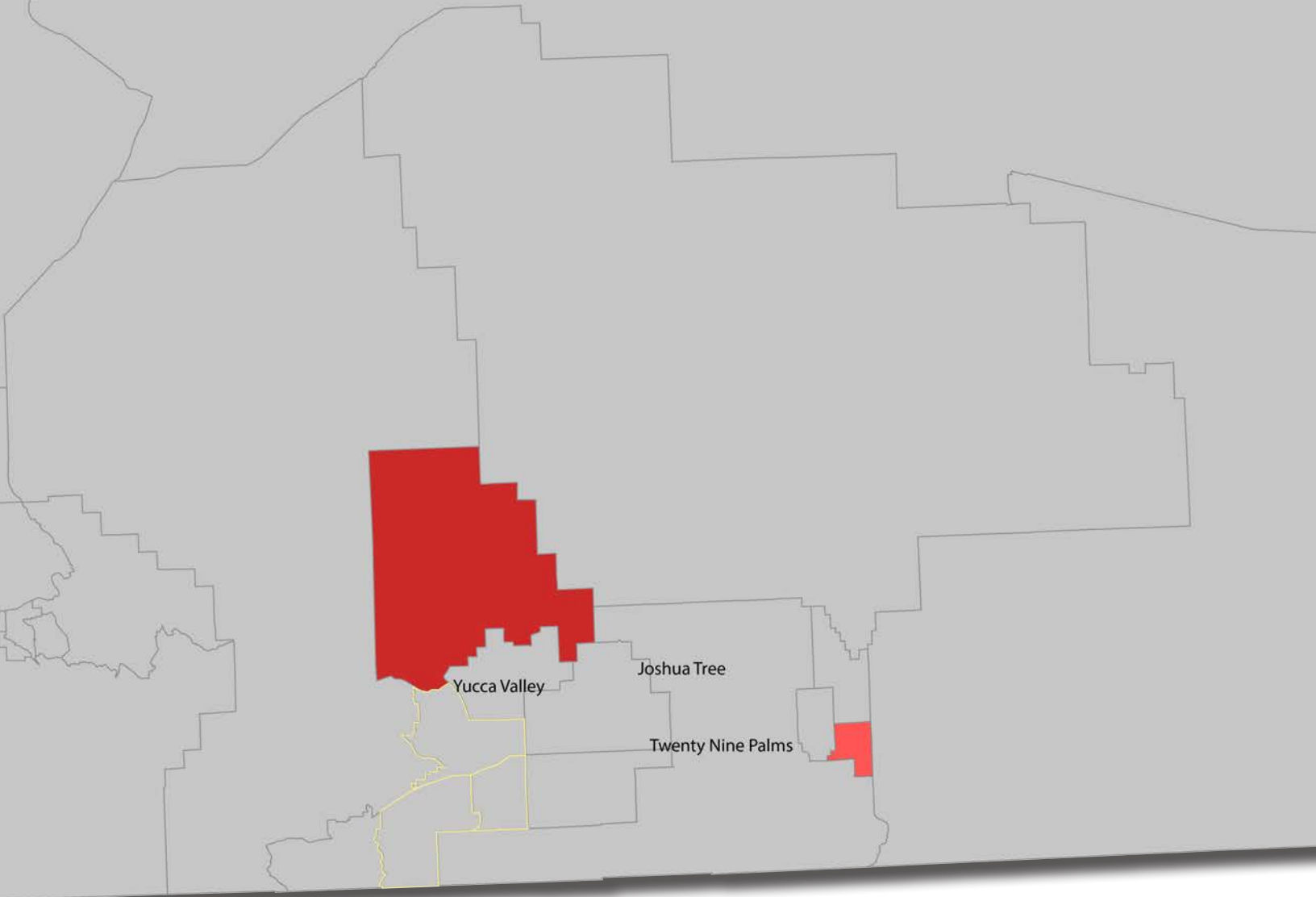
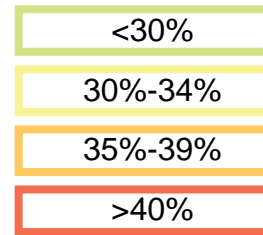
This map combines both the HPLA Food Desert map and Severity of Obesity Map. The majority of HPLA food deserts can be found within cities where obesity rates are over 35%.



Severity of Need



**Percent of Adult Residents
Who Are Obese**







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